

Site Health and Safety Plan

Avery Landing Site
Avery, Idaho

for

**U.S. Environmental Protection Agency on Behalf
of Potlatch Land and Lumber**

March 4, 2013



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Site Health and Safety Plan

Avery Landing Site Avery, Idaho

File No. 2315-016-02

March 4, 2013

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1.0 INTRODUCTION

This HASP is to be used in conjunction with the GeoEngineers Safety Program Manual. Together, the written safety programs and this HASP constitute the site safety plan for this site. This plan is to be used by GeoEngineers personnel on this site and must be available on-site. If the work entails potential exposures to other substances or unusual situations, additional safety and health information will be included, and the plan will need to be approved by the GeoEngineers Health and Safety Manager. All plans are to be used in conjunction with current standards and policies outlined in the GeoEngineers Health and Safety Program Manual.

1.1. Liability Clause

If requested by subcontractors, this site safety plan may be provided for informational purposes only. In this case, Form C-3 shall be signed by the subcontractor. Please be advised that this Site Safety Plan is intended for use by GeoEngineers Employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this site to use or legally rely on this Site Safety Plan. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by them.

1.2. General Project Information

Project Name:	Avery Landing Removal Action
Project Number:	2315-016-02
Type of Project:	Construction Observation and Compliance Sampling
Start/Completion:	Spring 2013/Fall 2013
Contractors:	Pacific Pile and Marine
Subcontractors:	TBD

2.0 BACKGROUND INFORMATION

2.1. Site Location

The Site is located in the St. Joe River Valley of the Bitterroot Mountains in northern Idaho, approximately one mile west of the town of Avery in Shoshone County. The St. Joe River borders the Site to the south and Highway 50 borders the Site to the north.

- The Site is located in the NW quarter of Section 16, Township 45 North, Range 5 East, Willamette Meridian.
- Latitude 47° 13' 57" North and Longitude W 115° 43' 40" West.

2.2. Site History

Detailed information regarding Site and operational history, previous investigations and regulatory history and cleanup actions are presented in EPA's EE/CA (E&E, 2010) and/or Supplemental Investigation Report (GeoEngineers, 2011) and are summarized in the Avery Landing Removal Action Work Plan (Work Plan; GeoEngineers, 2013).

3.0 WORK PLAN

In general, EPA's selected removal action requires the excavation of subsurface soil contaminated with petroleum hydrocarbons (diesel and heavy oil). Removal of this material is expected to significantly reduce or eliminate the source of contamination at the Site and to prevent the continued discharge of petroleum hydrocarbons and hazardous substances into the St. Joe River. The oil and hazardous substances are comingled and cannot be segregated. Residual contamination remaining at the Site is expected to attenuate by way of natural processes and the progress of the attenuation will be monitored over-time, following the completion of the removal action.

The objectives of the removal action are to:

- Remove the remaining components of the product containment, collection, and extraction systems that were installed as part of the 1994 and 2000 removal actions;
- Remove soil exceeding field screening methods within the upland and river bank areas;
- Remove, treat, and/or manage petroleum product that is present as light Non-Aqueous Phase Liquids (LNAPL) on groundwater within the excavations;
- Dispose of waste streams in accordance with CERCLA's off-site rule requirements; and
- Restore portions of the Site affected by the removal action including river bank reconstruction, backfilling, compaction, grading and re-vegetation.

The conceptual design and preliminary approach for the removal action that will be performed by Potlatch is summarized in the Work Plan.

3.1. Field Activities

The following activities are anticipated for GeoEngineers field personnel during the implantation of the Potlatch Property removal action and post-construction monitoring activities:

- Construction Observation
- Field Screening of Soil Samples
- Headspace Vapor Measurements
- Verification Soil Sample Collection
- Soil Stockpile Sample Collection
- Groundwater Treatment System Sampling

- Surface Water Quality Monitoring
- Recovery of Free Product
- Product Sample Collection
- Monitoring Well Installation
- Monitoring Well Development
- Groundwater Sample Collection

3.2. Field Personnel, Training Records, and Chain of Command

LIST OF FIELD PERSONNEL AND TRAINING

Name of Employee	Level of HAZWOPER Training (24-/40-hr)	Date of 8-Hr Refresher Training	Date of HAZWOPER Supervisor Training	First Aid/ CPR	Date of Respirator Fit Test
John Haney	40	Feb-2012	Feb-2008	Feb-2012	TBD
Robert Trahan	40	Sept-2012	June-2008	Dec-2010	Oct-2006
Abhijit Joshi	40	Oct-2012	N/A	March-2011	TBD
Scott Lathen	40	Feb-2012	N/A	Dec-2010	Feb-2011
Brian Tracy	40	Sept-2012	Feb-2008	Feb-2011	TBD
Paul Robinette	40	Apr-2012	Dec-2002	Dec-2011	Aug-2012
Garret Leque	40	Feb-2010	July-2003	Aug-2011	Feb-2010
Aaron Waggoner	40	Feb-2012	Aug-2000	Dec-2010	Oct-2011

Chain of Command	Title	Name	Telephone Numbers
1	Project Manager	John Herzog	206.239.3252
2	HAZWOPER Supervisor(s)	John Haney	509.768.5861
		Robert Trahan	206.239.3253
3	Field Engineer/Geologist(s)	Robert Trahan	206.239.3253
		Scott Lathen	509.363.3125
		Abhijit Joshi	206.239.3256
		Brian Tracy	206.679.1643
		Paul Robinette	253.278.0273
		Garrett Leque	253.312.7958
		Aaron Waggoner	253.579.2176
4	Site Safety and Health Supervisor(s)*	Robert Trahan	206.239.3253
		Scott Lathen	509.363.3125
		Abhijit Joshi	206.239.3256
		Brian Tracy	206.679.1643

Chain of Command	Title	Name	Telephone Numbers
		Paul Robinette	253.278.0273
		Garrett Leque	253.312.7958
		Aaron Waggoner	253.579.2176
5	Client Assigned Site Supervisor	Terry Cundy	208-883-1668
6	Health and Safety Program Manager	Wayne Adams	253.722.2793
N/A	Contractor	Pacific Pile and Marine	206.331.3873
		Potlatch Land and	
N/A	Current Owner	Lumber	509.835.1500

*** Site Safety and Health Supervisor** – The individual present at a hazardous waste site responsible to the employer and who has the authority and knowledge necessary to establish the site-specific health and safety plan and verify compliance with applicable safety and health requirements.

Emergency Information

Hospital Name and Address:

Shoshone Medical Center
25 Jackass Gulch Road
Kellogg, Idaho 83837

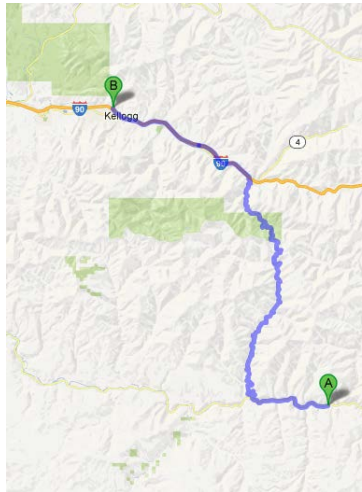
Phone Numbers (Hospital ER):

Phone: 208.784.1221

Distance: 42 miles

Route to Hospital:

1. Head west on Milwaukee Rd Rail-Trail/NF-50/St Joe River Rd – go 5.5 miles
2. Turn right onto NF-225/Slate Creek Rd - go 14.5 mile
3. Turn right to stay on NF-225/Slate Creek Rd – go 3.1 miles
4. Continue onto Hord's Ranch Rd/NF-985 - go 2.6 miles
5. Turn left onto NF-456/Placer Creek Rd - go 3.3 miles
6. NF-456/Placer Creek Rd turns slightly right and becomes King St - go 0.4 miles
7. King St turns right and becomes Bank St – go 0.1 miles
8. Turn left onto 2nd St – go 0.2 miles
9. Turn left onto River St – go 0.3 miles



Commented [PJC1]: Is this a better choice than the medical center in St Maries, considering their ER capability and the overall drive time?

Commented [SH2]: This one caught my attention, too. I remember seeing this Forest Service road, but I haven't been on it. How viable is this route? Even if it is as good as Moon Pass Road to Wallace, it will likely be closed for part of the year, and St. Maries is still probably the best bet.

10. Continue onto N Frontage Rd – go 0.1 mile
11. Turn left to merge onto I-90 W – go 11 mile
12. Take exit 49 for Bunker Ave toward Silver Mtn. – go 0.2 mile
13. Turn right onto Bunker Ave – Destination will be on the right

Ambulance:

Poison Control:

Police:

Fire:

Location of Nearest Telephone:

Nearest Fire Extinguisher:

Nearest First-Aid Kit:

9-1-1

(800) 732-6985

9-1-1

9-1-1

Cell phones are carried by field personnel.

Located in the GeoEngineers vehicle on-site.

Located in the GeoEngineers vehicle on-site.

Commented [SH3]: Note that emergency service to Avery is provided by Benewah County, not Shoshone County. Also, USFS is also contacted by 911 and may be able to respond.

Additional Emergency Contact Information

- Statewide Medical Emergency Response – 208.846.7610
- Northwest Medstar (Helicopter Evacuation) – 800.422.2440

Utility Locate

- Avista Emergency Utility Line Locate – 800.227.9187
- Avista Utility Line Locate (Benewah and Shoshone Counties – 800.398.3285

Fuel/Chemical Spills

- State Response Center – 800.632.8000
- National Response Center – 800.424.8802

Forest Fires

- Idaho Department of Lands (St. Maries) – 208.245.4551
- United States Forest Service (St. Maries) – 208.245.2531

County Sheriffs (Dispatch)

- Benewah County (St. Maries) – 208.245.2555
- Shoshone County (Wallace) – 208.556.1114

3.3. Standard Emergency Procedures

Get help

- Send another worker to phone 9-1-1 (if necessary)
- As soon as feasible, notify GeoEngineers' Technical Project Manager

Reduce risk to injured person

- Turn off equipment
- Move person from injury location (if in life-threatening situation only)
- Keep person warm
- Perform CPR (if necessary)

Transport injured person to medical treatment facility (if necessary)

- By ambulance (if necessary) or vehicle
- Stay with person at medical facility
- Keep GeoEngineers manager apprised of situation and notify Human Resources Manager of situation
- As soon as feasible, notify Potlatch:
 - Terry Cundy – 208.883.1668 (O), 208.301.0410 (C)
 - Brandon Miller – 208.245.6436 (O), 208.874.7588 (C)

4.0 HAZARD ANALYSIS

This section presents hazards that may be potentially present at the Site. A hazard assessment will be completed at the Site prior to beginning field activities. Updates will be included in the daily log.

4.1. Physical Hazards

- Drill rigs (Monitoring Well Installation)
- Backhoe
- Trackhoe
- Off-Road dump truck
- Front End Loader
- Excavations/trenching (1:1 slopes for Type B soil)
- Shored/braced excavation if greater than 4 feet of depth
- Overhead hazards/power lines
- Tripping/puncture hazards (debris on-site, steep slopes or pits)
- Unusual traffic hazard – Street traffic
- Heat/Cold, Humidity
- Utilities/ utility locate

4.1.1. Safe Work Practices

- Utility checklist will be completed as required for the location to preventing drilling or digging into utilities.
- Work areas will be marked with reflective cones, barricades and/or caution tape. High-visibility vests will be worn by on-site personnel to ensure they can be seen by vehicle and equipment operators.
- Field personnel will be aware at all times of the location and motion of heavy equipment in the area of work to ensure a safe distance between personnel and the equipment. Personnel will be visible to the operator at all times and will remain out of the swing and/or direction of the equipment apparatus. Personnel will approach operating heavy equipment only when they are certain the operator has indicated that it is safe to do so through hand signal or other acceptable means.
- Heavy equipment and/or vehicles used on this site will not work within 20 feet of overhead utility lines without first ensuring that the lines are not energized. This distance may be reduced to 10 feet depending on the client and the use of a safety watch.
- Personnel entry into unshored or unsloped excavations deeper than 4 feet is not allowed. Any trenching and shoring requirements will follow guidelines established in OSHA 1926.651 Excavation Requirements.
 - In the event that a worker is required to enter an excavation deeper than 4 feet, a trench box or other acceptable shoring will be employed or the side walls of the excavation will be sloped according to the soil type and guidelines as outlined in DOSH/OSHA regulations.
 - If the shoring/sloping deviates from that outlined in OSHA, it will be designed and stamped by a PE.
 - Prior to entry, personnel will conduct air monitoring as described later in this plan.
 - All hazardous encumbrances and excavated material will be stockpiled at least 2 feet from the edge of a trench or open pit.
 - If concentrations of volatile gases accumulate within an open trench or excavation, the means of entering shall adhere to confined space entry and air monitoring procedures outlined under the air monitoring recommendations in this Plan and/or the GeoEngineers Health and Safety Program.
- Personnel will avoid tripping hazards, steep slopes, pits and other hazardous encumbrances.
 - If it becomes necessary to work within 6 feet of the edge of a pit, slope or other potentially hazardous area, appropriate fall protection measures will be implemented by the Site Safety and Health Supervisor in accordance with OSHA/DOSH regulations and the GeoEngineers Health and Safety Program.
- Cold stress control measures will be implemented according to the GeoEngineers Health and Safety Program to prevent frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature). Heated break areas and warm beverages shall be available during periods of cold weather.
- Heat stress control measures required for this site will be implemented according to GeoEngineers Health and Safety Program with water provided on-site.

4.1.2. Engineering Controls

- Trench shoring (1:1 slope for Type B Soils)
- Location work spaces upwind/wind direction monitoring
- Stockpiled soil will be covered as conditions warrant
- Site controls will be implemented to restrict access to the Site from the general public

4.2. Chemical Hazards

CHEMICAL HAZARDS AND EXPOSURES (POTENTIALLY PRESENT AT SITE)

Compound/ Description	Exposure Limits/IDLH	Exposure Routes	Symptoms/Health Effects
Diesel Fuel — liquid with a characteristic odor	None established by OSHA, but ACGIH has adopted 100 mg/m ³ for a TWA (as total hydrocarbons)	Ingestion, inhalation, skin absorption, skin and eye contact	Irritated eyes, skin, and mucous membrane; fatigue; blurred vision; dizziness; slurred speech; confusion; convulsions; headache; dermatitis
Polycyclic aromatic hydrocarbons (PAH) as coal tar pitch volatiles	PEL 0.2 mg/m ³ TLV 0.2 mg/m ³ REL 0.1 mg/m ³ IDLH 80 mg/m ³	Inhalation, ingestion, skin and/or eye contact	Dermatitis, bronchitis, potential carcinogen
PCBs (as Arochlor 1254)—colorless to pale-yellow viscous liquid with a mild, hydrocarbon odor	PEL 0.5 mg/m ³ TLV 0.5 mg/m ³ REL 0.001 mg/m ³ IDLH 5.0 mg/m ³	Inhalation (dusts or mists), skin absorption, ingestion, skin and/or eye contact	Irritated eyes, chloracne, liver damage, reproductive effects, potential carcinogen
Benzene	OSHA PEL 1 ppm Short term: 5 ppm ACGIH PEL 0.5 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritated eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]
Xylene (m, p, o)	OSHA PEL 100 ppm NIOSH REL 100 ppm Short term: 150 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Compound/ Description	Exposure Limits/IDLH	Exposure Routes	Symptoms/Health Effects
Trimethylbenzene (1,2,4 and 1,3,5)	NIOSH REL 25 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)
Trichloroethene	OSHA PEL 100 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]
p-Nitroaniline	OSHA PEL 1 ppm NIOSH REL 3 mg/m ³	Inhalation, skin absorption, ingestion, skin	irritation nose, throat; cyanosis, ataxia; tachycardia, tachypnea; dyspnea (breathing difficulty); irritability; vomiting, diarrhea; convulsions; resp arrest; anemia; methemoglobinemia; jaundice
Dinitro-o-cresol	OSHA PEL 0.2 mg/m ³ NIOSH REL 0.2 mg/m ³	Inhalation, skin absorption, ingestion, skin	Sense of well-being; headache, fever, lassitude (weakness, exhaustion), profuse sweating, excess thirst, tachycardia, hyperpnea, cough, short breath, coma
Antimony	NIOSH REL: TWA 0.5 mg/m ³ OSHA PEL: TWA 0.5 mg/m ³	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat, mouth; cough; dizziness; headache; nausea, vomiting, diarrhea; stomach cramps; insomnia; anorexia; unable to smell properly
Arsenic	NIOSH REL: 0.002 mg/m ³ (15-minute) OSHA PEL: TWA 0.010 mg/m ³	Inhalation, skin absorption, ingestion, skin and/or eye contact	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]

Compound/ Description	Exposure Limits/IDLH	Exposure Routes	Symptoms/Health Effects
Barium Chloride (as Ba)	NIOSH REL: TWA 0.5 mg/m ³ OSHA PEL: TWA 0.5 mg/m ³ Also applies to other soluble barium compounds (as Ba) except Barium sulfate.	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, upper respiratory system; skin burns; gastroenteritis; muscle spasm; slow pulse, extrasystoles; hypokalemia
Beryllium & beryllium compounds (as Be)	NIOSH REL: 0.0005 mg/m ³ OSHA PEL: TWA 0.002 mg/m ³ C 0.005 mg/m ³ (30 minutes), with a maximum peak of 0.025 mg/m ³	Inhalation, skin and/or eye contact	Berylliosis (chronic exposure): anorexia, weight loss, lassitude (weakness, exhaustion), chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency; irritation eyes; dermatitis; [potential occupational carcinogen]
Cobalt metal dust and fume (as Co)	NIOSH REL: TWA 0.05 mg/m ³ OSHA PEL: TWA 0.1 mg/m ³	Inhalation, ingestion, skin and/or eye contact	Cough, dyspnea (breathing difficulty), wheezing, decreased pulmonary function; weight loss; dermatitis; diffuse nodular fibrosis; resp hypersensitivity, asthma
Iron oxide dust and fume (as Fe)	NIOSH REL: TWA 5 mg/m ³ OSHA PEL: TWA 10 mg/m ³	Inhalation	Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)
Lead	NIOSH REL: TWA (8-hour) 0.050 mg/m ³ OSHA PEL: TWA 0.050 mg/m ³	Inhalation, ingestion, skin and/or eye contact	lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension
Manganese Compounds	NIOSH REL: TWA 1 mg/m ³ ST 3 mg/m ³ OSHA PEL: 5 mg/m ³	Inhalation, ingestion	Manganism; asthenia, insomnia, mental confusion; metal fume fever: dry throat, cough, chest tightness, dyspnea (breathing difficulty), rales, flu-like fever; low-back pain; vomiting; malaise (vague feeling of discomfort); lassitude (weakness, exhaustion); kidney damage

Compound/ Description	Exposure Limits/IDLH	Exposure Routes	Symptoms/Health Effects
Mercury Compounds	NIOSH REL: Hg Vapor: TWA 0.05 mg/m ³ Other: C 0.1 mg/m ³ [skin] OSHA PEL: TWA 0.1 mg/m ³	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis; tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria

Notes:

IDLH = immediately dangerous to life or health
 OSHA = Occupational Safety and Health Administration
 ACGIH = American Conference of Governmental Industrial Hygienists
 mg/m³ = milligrams per cubic meter
 TWA = time-weighted average (Over 8 hrs.)
 PEL = permissible exposure limit
 TLV = threshold limit value (over 10 hrs)
 STEL = short-term exposure limit (15 min)
 ppm = parts per million

4.2.1. Polycyclic Aromatic Hydrocarbons (PAHs) and Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs)

Exposure to cPAHs can occur via inhalation of vapors, ingestion, and skin and eye contact. Skin contact can result in reddening or corrosion. Ingestion can cause nausea, vomiting, blood pressure fall, abdominal pain, convulsions and coma. Damage to the central nervous system can also occur. The U.S. Department of Health and Human Services (1989) has classified 15 PAHs compounds as having sufficient evidence for carcinogenicity, while the U.S. EPA (1990) has classified at least 5 of the identified PAHs as human carcinogens. There is no currently assigned PEL-TWA for cPAHs, but the closely related material coal tar is listed as coal tar pitch volatiles with a PEL-TWA of 0.2 mg/m³. PAHs and cPAHs as soil contaminants can be irritating to eyes and mucous membranes. PAHs are also formed during combustion and are linked to lung cancers with exposure to combustion byproducts. Lymphatic cancers are reported in the literature with PAHs in the presence of carbon black.

4.2.2. Polychlorinated Biphenyl Compounds (PCBs)

PCB is a generic term for a range of polychlorinated biphenyl compounds used commercially in heat transfer media and in the chemical/coatings industry. PCBs have been marketed commercially under the trade names Askarel® and Aroclor®, with a designation referring to the percent weight of chlorine. Prolonged skin contact with PCBs may cause acne-like symptoms, known as chloracne. Irritation to eyes, nose and throat may also occur. Acute and chronic exposure can cause liver damage, and symptoms of edema, jaundice, anorexia, nausea, abdominal pains and fatigue. If pregnant women accidentally ingest PCBs, stillbirth or infant skin and eye problems may occur. PCBs are a suspect human carcinogen. The EPA currently classifies PCBs as a Class B2, or probable, human carcinogen. The Washington State Permissible Exposure Limit (PEL)-Time Weighted Average (TWA) for PCBs with 54 percent chlorine content is 0.5

milligrams per cubic meter (mg/m³), while the PEL-TWA for PCBs with 42 percent chlorine is 1 mg/m³. Skin exposure may contribute significantly to uptake of these chemicals, and therefore all skin exposure to the liquid product or contaminated water, soil or dust should be strictly avoided.

4.3. Biological Hazards

Hazard	Prevention Procedure
Poison Ivy or other vegetation	Wear work gloves and long sleeve shirt
Insects or snakes	Wear work gloves and long sleeve shirt
Used hypodermic needles or other infectious hazards	Do not pick up or contact
Others: Bird droppings	Wear hard hat, gloves and long sleeve shirt

4.4. Hazards Reporting/Documentation

Update in Daily Report. Include evaluation of:

- *Physical Hazards* (excavations and shoring, equipment, traffic, tripping, heat stress, cold stress and others)
- *Chemical Hazards* (odors, spills, free product, airborne particulates and others present)
- *Biological Hazards* (snakes, spiders, other animals, discarded needles, poison ivy, pollen, bees/wasps and others present)

5.0 AIR MONITORING PLAN

AIR MONITORING, FREQUENCY, LOCATION AND ACTION LEVELS

Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes and in event of odors	Background to 5 ppm in breathing zone	Use Level D or Modified Level D PPE
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes and in event of odors	5 to 25 ppm in breathing zone	Upgrade to Level C PPE
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes	> 25 ppm in breathing zone	Stop work and evacuate the area. Contact Health and Safety Manager for guidance.

Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Combustible Atmosphere	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes	>10% LEL or >1,000 ppm	Depends on contaminant. The PEL is usually exceeded before the lower explosive limit (LEL).
Combustible Atmosphere	Environmental Remedial Actions	PID or 4-gas meter	Start of shift; prior to excavation entry; every 30 to 60 minutes	>10% LEL or >1,000 ppm	Stop work and evacuate the site. Contact Health and Safety Manager for guidance.
Oxygen Deficient/ Enriched Atmosphere	Environmental Remedial Actions or Confined Spaces	Oxygen meter or 4-gas meter	Start of shift; prior to excavation entry; every 30 to 60 minutes	<19.5>23.5%	Continue work if inside range. If outside range, evacuate area and contact Health and Safety Manager.

Commented [PJC4]: PID FOR LEL measurement? Why not LEL monitor? Other information in this plan indicates a 4-gas meter will be present. 4-gas meter typically has LEL sensor.

Commented [PJC5]: IF PEL IS EXCEEDED THEN MUST STOP WORK

- The workspace will be monitored using a photoionization detector (PID). These instruments must be properly maintained, calibrated and charged (refer to the instrument manuals for details). Zero this meter in the same relative humidity as the area in which it will be used and allow at least a 10-minute warm-up prior to zeroing. Do not zero in a contaminated area. The PID can be tuned to read chemicals specifically if there are not multiple contaminants on-site. It can be tuned to detect one chemical with the response factor entered into the equipment, but the PID picks up all volatile organic compounds (VOCs) present. The ionization potential (IP) of the chemical has to be less than the PID lamp (11.7 / 10.6eV), and the PID does not detect methane. The ppm readout on the instrument is relative to the IP of isobutylene (calibration gas), so conversion must be made in order to estimate ppm of the chemical on-site.
- An initial vapor measurement survey of the site should be conducted to detect "hot spots" if contaminated soil is exposed at the surface. Vapor measurement surveys of the workspace should be conducted at least hourly or more often if persistent petroleum-related odors are detected. Additionally, if vapor concentrations exceed 5 ppm above background continuously for a 5-minute period as measured in the breathing zone, upgrade to Level C personal protective equipment (PPE) or move to a noncontaminated area.
- Standard industrial hygiene/safety procedure is to require that action be taken to reduce worker exposure to organic vapors when vapor concentrations exceed one-half the TLV.

Because of the variety of chemicals, the PID will not indicate exposure to a specific PEL and is therefore not a preferred tool for determining worker exposure to chemicals. If odors are detected, then employees shall upgrade to respirators with Organic Vapor cartridges and will contact the Health and Safety Program Manager for other sampling options.

6.0 SITE CONTROL PLAN

Work zones will be considered to be within the delineated construction area or within 50 feet of any active construction equipment. Employees should work upwind of the machinery if possible. To the extent practicable, use the buddy system. Do not approach heavy equipment unless you are sure the operator sees you and has indicated it is safe to approach. All personnel from GeoEngineers and subcontractor(s) should be made aware of safety features during each morning's safety tailgate meeting (drill rig shutoff switch, location of fire extinguishers, cell phone numbers etc.). For medical assistance, see Section 3.0 above.

A contamination reduction zone should be established for personnel before leaving the Facility or before breaking for lunches etc. The zone should consist of garbage bags into which used PPE should be disposed. Personnel should wash hands at the Facility before eating or leaving the Facility.

6.1. Traffic or Vehicle Access Control Plans

Traffic entering and exiting the Site will be through controlled access points. Flaggers will be used as necessary to control traffic at the controlled access points. Site personnel will be instructed to stop and look both ways before crossing any vehicle access point/roadway.

6.2. Site Work Zones

Fencing (chain link, orange construction netting, silt fence or similar), Survey Tape, Traffic Cones, Posted signage and/or barricades will be used to delineate the work zone and excluding non-site personnel from entering the work zone.

- Hot zone/exclusion zone: *Within 10 feet of any boring or open excavation*
- Contamination reduction zone: Within the Site work zone greater than 10 feet of any boring or open excavation
- Decontamination Zone : Wash stations will be set up for use by Site personnel

6.3. Buddy System

Personnel on-site should use the buddy system (pairs), particularly whenever communication is restricted. If only one GeoEngineers employee is on-site, a buddy system can be arranged with subcontractor/ contractor personnel.

6.4. Site Communication Plan

Positive communications (within sight and hearing distance or via radio) should be maintained between pairs on-site, with the pair remaining in proximity to assist each other in case of emergencies. The team should prearrange hand signals or other emergency signals for

Commented [PJC6]: What is the communication plan? How will emergency calls be initiated? Is a land line available on site? If not—then what? cell phone? Is there reliable cell service)? What about on site communications—radios? Or just the hand gestures?

communication when voice communication becomes impaired (including cases of lack of radios or radio breakdown). In these instances, you should consider suspending work until communication can be restored. If not, the following are some examples for communication:

1. Hand gripping throat: Out of air, can't breathe.
2. Gripping partner's wrist or placing both hands around waist: Leave area immediately, no debate.
3. Hands on top of head: Need assistance.
4. Thumbs up: Okay, I'm all right: or I understand.
5. Thumbs down: No, negative.

6.5. Decontamination Procedures

Decontamination consists of removing outer protective Tyvek clothing and washing soiled boots and gloves using bucket and brush provided on-site in the contamination reduction zone. Inner gloves will then be removed, and respirator, hands and face will be washed in either a portable wash station or a bathroom facility in the support zone. Employees will perform decontamination procedures and wash prior to eating, drinking or leaving the site.

6.6. Waste Disposal or Storage

Used PPE to be placed in trash containers. Drill cuttings will be placed in on-site drums pending characterization and disposal.

7.0 PERSONAL PROTECTIVE EQUIPMENT

After the initial and/or daily hazard assessment has been completed the appropriate protective personal protective equipment (PPE) will be selected to ensure worker safety. Task-specific levels of PPE shall be reviewed with field personnel during the pre-work briefing conducted prior to the start of site operations. Task-specific levels of PPE shall be reviewed with field personnel during the pre-work briefing conducted prior to the start of site operations.

Site activities may include handling and sampling solid subsurface material (material may potentially be saturated with groundwater). Depth-to-groundwater measurements may be performed as well. Site hazards include potential exposure to hazardous materials, and physical hazards such as trips/falls, heavy equipment, and exposure.

Air monitoring will be conducted to determine the level of respiratory protection.

- Half-face combination organic vapor/high efficiency particulate air (HEPA) or P100 cartridge respirators will be available on-site to be used as necessary. P100 cartridges are to be used only if PID measurements are below the site action limit. P100 cartridges are used for protection against dust, metals and asbestos, while the combination organic vapor/HEPA cartridges are protective against both dust and vapor. Ensure that the PID or TLV will detect the chemicals of concern on-site.

- Level D PPE unless a higher level of protection is required will be worn at all times on the site. Potentially exposed personnel will wash gloves, hands, face and other pertinent items to prevent hand-to-mouth contact. This will be done prior to hand-to-mouth activities including eating, smoking, etc.
- Adequate personnel and equipment decontamination will be used to decrease potential ingestion and inhalation.

Applicable personal protection gear to be used:

- Hardhat (if overhead hazards, or client requests)
- Steel-toed boots (if crushing hazards are a potential or if client requests)
- Safety glasses (if dust, particles, or other hazards are present or client requests)
- Hearing protection (if it is difficult to carry on a conversation 3 feet away)
- Rubber boots (if wet conditions)
- Nitrile gloves

Anticipated types of gloves to be used:

- Nitrile

Anticipated protective clothing to be needed

- Cotton
- Rain gear (as needed)
- Layered warm clothing (as needed)

Anticipated inhalation hazard protection:

- Level D

7.1. Personal Protective Equipment Inspections

PPE clothing ensembles designated for use during site activities shall be selected to provide protection against known or anticipated hazards. However, no protective garment, glove or boot is entirely chemical-resistant, nor does any PPE provide protection against all types of hazards. To obtain optimum performance from PPE, site personnel shall be trained in the proper use and inspection of PPE. This training shall include the following:

- Inspect PPE before and during use for imperfect seams, non-uniform coatings, tears, poorly functioning closures or other defects. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Inspect PPE during use for visible signs of chemical permeation such as swelling, discoloration, stiffness, brittleness, cracks, tears or other signs of punctures. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.

- Disposable PPE should not be reused after breaks unless it has been properly decontaminated.

7.2. Respirator Selection, Use and Maintenance

If respirators are required, Site personnel shall be trained before use on the proper use, maintenance and limitations of respirators. Additionally, they must be medically qualified to wear a respiratory protection in accordance with 29 CFR 1910.134. Site personnel who will use a tight-fitting respirator must have passed a qualitative or quantitative fit test conducted in accordance with an OSHA-accepted fit test protocol. Fit testing must be repeated annually or whenever a new type of respirator is used. Respirators will be stored in a protective container.

7.3. Respirator Cartridges

If Site personnel are required to wear air-purifying respirators, the appropriate cartridges shall be selected to protect personnel from known or anticipated site contaminants. The respirator/cartridge combination shall be certified and approved by the National Institute for Occupational Safety and Health (NIOSH). A cartridge change-out schedule shall be developed based on known site contaminants, anticipated contaminant concentrations and data supplied by the cartridge manufacturer related to the absorption capacity of the cartridge for specific contaminants. Site personnel shall be made aware of the cartridge change-out schedule prior to the initiation of site activities. Site personnel shall also be instructed to change respirator cartridges if they detect increased resistance during inhalation or detect vapor breakthrough by smell, taste or feel, although breakthrough is not an acceptable method of determining the change-out schedule.

7.4. Respirator Inspection and Cleaning

Site personnel shall inspect respirators prior to each use in accordance with the manufacturer's instructions. In addition, site personnel wearing a tight-fitting respirator shall perform a positive and negative pressure user seal check each time the respirator is donned, to ensure proper fit and function. User seal checks shall be performed in accordance with the GeoEngineers respiratory protection program or the respirator manufacturer's instructions.

8.0 ADDITIONAL ELEMENTS

8.1. Cold Stress Prevention

Working in cold environments presents many hazards to site personnel and can result in frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature).

The combination of wind and cold temperatures increases the degree of cold stress experienced by site personnel. Site personnel shall be trained on the signs and symptoms of cold-related illnesses, how the human body adapts to cold environments, and how to prevent the onset of cold-related illnesses. Heated break areas and warm beverages shall be provided during periods of cold weather.

8.2. Heat Stress Prevention

State and federal OSHA regulations provide specific requirements for handling employee exposure to heat stress. GeoEngineers' program complies with these requirements and will be implemented in all areas where heat stress is identified as a potential health issue.

General requirements for preventing heat stress apply to outdoor work environments from May 1 through September 30, annually, only when employees are exposed to outdoor heat at or above an applicable temperature listed in the following table. To determine which temperature applies to each worksite, select the temperature associated with the general type of clothing or personal protective equipment (PPE) each employee is required to wear.

Keeping workers hydrated in a hot outdoor environment requires that more water be provided than at other times of the year. GeoEngineers is prepared to supply at least one quart of drinking water per employee per hour. When employee exposure is at or above an applicable temperature listed in the following table, the Project Manager shall ensure that:

- A sufficient quantity of drinking water is readily accessible to employees at all times; and
- All employees have the opportunity to drink at least one quart of drinking water per hour.

HEAT STRESS PREVENTION

Type of Clothing	Outdoor Temperature Action Levels (Degrees Fahrenheit)
Non-breathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
All other clothing	89°

9.2 Emergency Response

- Personnel on-site should use the "buddy system" (pairs).
- Visual contact should be maintained between "pairs" on-site, with the team remaining in proximity to assist each other in case of emergencies.
- If any member of the field crew experiences any adverse exposure symptoms while on-site, the entire field crew should immediately halt work and act according to the instructions provided by the Site Safety and Health Supervisor.
- Wind indicators visible to all on-site personnel should be provided by the Site Safety and Health Supervisor to indicate possible routes for upwind escape. Alternatively, the Site Safety and Health Supervisor may ask on-site personnel to observe the wind direction periodically during site activities.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team, contact of the PM, and reevaluation of the hazard and the level of protection required.

- If an accident occurs, the Site Safety and Health Supervisor and the injured person are to complete, within 24 hours, an Accident Report for submittal to the PM, the Health and Safety Program Manager and Human Resources. The PM should ensure that follow-up action is taken to correct the situation that caused the accident or exposure.

9.0 MISCELLANEOUS

9.1. Personnel Medical Surveillance

GeoEngineers employees are not in a medical surveillance program because they do not fall into the category of “Employees Covered” in OSHA 1910.120(f)(2), which states a medical surveillance program is required for the following employees:

1. All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;
2. All employees who wear a respirator for 30 days or more a year or as required by state and federal regulations;
3. All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and
4. Members of HAZMAT teams.

9.2. Spill Containment Plans (Drum and Container Handling)

Contractors or subcontractors will be responsible for developing and implanting Spill Prevention and Containment Plans for use during Site work.

9.3. Sampling, Managing and Handling Drums and Containers

Drums and containers used during the cleanup shall meet the appropriate Department of Transportation (DOT), OSHA and U.S. Environmental Protection Agency (EPA) regulations for the waste that they contain. Site operations shall be organized to minimize the amount of drum or container movement. When practicable, drums and containers shall be inspected and their integrity shall be ensured before they are moved. Unlabeled drums and containers shall be considered to contain hazardous substances and handled accordingly until the contents are positively identified and labeled. Before drums or containers are moved, all employees involved in the transfer operation shall be warned of the potential hazards associated with the contents.

Drums or containers and suitable quantities of proper absorbent shall be kept available and used where spills, leaks or rupture may occur. Where major spills may occur, a spill containment program shall be implemented to contain and isolate the entire volume of the hazardous substance being transferred. Fire extinguishing equipment shall be on hand and ready for use to control incipient fires.

9.4. Entry Procedures for Tanks or Vaults (Confined Spaces)

GeoEngineers employees shall not enter confined spaces to perform work unless they have been properly trained and with hands-on experience in the use of retrieval equipment. If a project requires confined space entry, please include a copy of the confined space permit and include the training documentation in this HASP.

Trenches greater than 4 feet in depth with the potential for buildup of a hazardous atmosphere are considered confined spaces.

9.5. Sanitation

Washrooms will be available for use during Site work.

9.6. Lighting

Site activities will be conducted during daylight hours. Artificial lighting will be used as necessary if work is conducted after daylight hours.

9.7. Excavation, Trenching and Shoring

All employees working on project sites where there is an excavation greater than 4 feet in depth shall be trained in excavation safety and shall utilize safe procedures. OSHA designates a 5-foot depth for instituting excavation safety procedures; however GeoEngineers will use the more conservative depth of 4 feet as specified by states such as Washington, Oregon and California. This program is for the protection of employees while working in excavations; however, employees should not enter excavations if there is an alternative.

GeoEngineers employees often do not have stop work authority on projects controlled by other contractors. However, any GeoEngineers employee, regardless of job title, working in the field will be responsible for contacting the Project Manager if they observe practices on the job site that are serious safety violations that are not under their control. They will document the unsafe practices and will contact the site safety coordinator as identified by the client. If no one is on-site, the Project Manager, once notified, will contact the client. This action establishes GeoEngineers' commitment to site health and safety on all job sites as our duty of care to the public, contractors and clients.

GeoEngineers is responsible for its subcontractors and will also be providing inspections and corrections of any work that subcontractors perform around excavations.

10.0 DOCUMENTATION TO BE COMPLETED FOR HAZWOPER PROJECTS

The following forms are required for Hazardous Waste Operations and Emergency Response (HAZWOPER) projects:

- Field Log
- Health and Safety Plan acknowledgment by GeoEngineers employees (Form C-2)
- Contractors Health and Safety Plan Disclaimer (Form C-3)

- Conditional forms available at GeoEngineers office: Accident Report

The Field Report is to contain the following information:

- Updates on hazard assessments, field decisions, conversations with subcontractors, client or other parties, etc.;
- Air monitoring/calibration results, including: personnel, locations monitored, activity at the time of monitoring, etc.;
- Actions taken;
- Action level for upgrading PPE and rationale; and
- Meteorological conditions (temperature, wind direction, wind speed, humidity, rain, snow, etc.).

11.0 LIMITATIONS

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

12.0 REFERENCES

E & E (Ecology and Environment, Inc.), "Draft Final Engineering Evaluation /Cost Analysis, Avery Landing Site, Avery, Idaho," prepared for the United States Environmental Protection Agency, Region 10, dated December 2010.

GeoEngineers, Inc., "Draft Removal Action Work Plan, Avery Landing Site, Avery, Idaho" GEI File No. 2315-016-02, prepared for United States Environmental Protection Agency on Behalf of the Potlatch Corporation, dated March 4, 2013.

GeoEngineers, Inc., "Supplemental Site Investigation, Avery Landing Site, Avery, Idaho," GEI File No. 2315-016-01, prepared for Potlatch Forest Holdings, Inc., dated November 9, 2011.

Golder Associates, Inc., (Golder), "Final Engineering Evaluation /Cost Analysis Work Plan for the Avery Landing Site, Avery, Idaho," prepared for the Potlatch Forest Products Corporation, dated January 23, 2009.

FORM C-1
 HEALTH AND SAFETY PRE-ENTRY BRIEFING
 AVERY LANDING REMOVAL ACTION
 FILE NO. 2315-016-02

Inform employees, contractors and subcontractors or their representatives about:

- The nature, level and degree of exposure to hazardous substances they're likely to encounter;
- All site-related emergency response procedures; and
- Any identified potential fire, explosion, health, safety or other hazards.

Conduct briefings for employees, contractors and subcontractors, or their representatives as follows:

- A pre-entry briefing before any site activity is started; and
- Additional briefings, as needed, to make sure that the Site-specific HASP is followed.

Make sure all employees working on the Site are informed of any risks identified and trained on how to protect themselves and other workers against the Site hazards and risks

Update all information to reflect current sight activities and hazards.

All personnel participating in this project must receive initial health and safety orientation. Thereafter, brief tailgate safety meetings will be held as deemed necessary by the Site Safety and Health Supervisor.

The orientation and the tailgate safety meetings shall include a discussion of emergency response, Site communications and site hazards.

Company Employee

Date	Topics	Attendee	Name	Initials

FORM C-2
SITE SAFETY PLAN – GEOENGINEERS’ EMPLOYEE ACKNOWLEDGMENT
Avery Landing Removal Action
File No. 2315-016-02

All GeoEngineers' Site workers shall complete this form, which should remain attached to the Safety Plan and filed with other project documentation.

I hereby verify that a copy of the current Safety Plan has been provided by GeoEngineers, Inc., for my review and personal use. I have read the document completely and acknowledge an understanding of the safety procedures and protocol for my responsibilities on Site. I agree to comply with all required, specified safety regulations and procedures.

Print Name

Signature

DateThis image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

FORM C-3
SUBCONTRACTOR AND SITE VISITOR SITE SAFETY FORM
AVERY LANDING REMOVAL ACTION
FILE NO. 2315-016-02

I verify that a copy of the current Site Safety Plan has been provided by GeoEngineers, Inc. to inform me of the hazardous substances on Site and to provide safety procedures and protocols that will be used by GeoEngineers' staff at the Site. By signing below, I agree that the safety of my employees is the responsibility of the undersigned company.

Print Name

Signature

FirmDate[illegible]